WHAT IS CLAIMED IS:

1. A method for fabricating an insulating layer on a substrate, comprising:

providing a fluid to a substrate, wherein the fluid is provided in an aerosol form;

generating a supercritical process environment proximate to the substrate, the proximate supercritical process environment having a supercritical process temperature and a supercritical process pressure for altering the fluid; and

placing the substrate in contact with the altered fluid, wherein the insulating layer is formed on the substrate by a reaction between the substrate and the fluid.

2. The method of claim 1 further comprising:

converting the fluid from a liquid to the aerosol form; and

distributing the fluid in the aerosol form using an ultrasonic applicator.

3. The method of claim 1 further comprising:

converting the fluid from a liquid to the aerosol form; and

distributing the fluid in the aerosol form using a nebulizer.

4. The method of claim 1 wherein the fluid comprises water.

5. The method of claim 1 wherein the fluid is heated prior to being provided to the processing chamber.

6. The method of claim 1 wherein the substrate comprises a diamond, the substrate including a n-type region and a p-type region.

7. The method of claim 6 wherein the p-type region comprises a boron doped region.

8. The method of claim 6 wherein the n-type region comprises a deuterium-boron complex region, the n-type layer formed by a plasma treatment of the boron doped region.

9. The method of claim 1 further comprising heating the substrate to the supercritical process temperature, wherein the water is heated to the supercritical process temperature by the heated substrate.

10. The method of claim 9 further comprising heating a pedestal holding the substrate with a resistive coil.

11. The method of claim 9 wherein heating the substrate includes irradiating the substrate with infra-red radiation.

12. The method of claim 1 further comprising removing the substrate from contact with the heated fluid, wherein the substrate is repeatedly placed in contact with the heated fluid and removed from contact with the heated fluid until a desired thickness of the insulating layer is formed.

13. The method of claim 1 further including forming a conductive layer over the insulating layer.

14. The method of claim 1 further comprising removing at least a portion of the insulating layer to form a spacer around a gate of a transistor.

15. The method of claim 1 wherein the insulating layer isolates a plurality of interconnections in a damascene structure.

16. The method of claim 1 wherein the supercritical process temperature is approximately 374° C and wherein the supercritical process pressure is approximately 221 atmospheres.

17. The method of claim 1 further comprising:
determining whether the insulating layer is of a predetermined thickness; and

maintaining the contact between the substrate and the heated fluid if the insulating layer is not of the predetermined thickness.

18. A system for fabricating an insulating layer on a substrate, comprising:

a supercritical process environment including a substrate in a processing chamber, the processing chamber having a process temperature and a process pressure;

a control device for controlling the processing chamber at a supercritical level;

a fluid distribution device for providing a non-supercritical fluid to the processing chamber in an aerosol form; and

a heating device for heating the substrate to a supercritical temperature, wherein the fluid becomes a supercritical fluid due to the process pressure and the process temperature of the processing chamber, and wherein the insulator layer is formed by contact between the substrate and the supercritical fluid.

19. The system of claim 18 wherein the control device controls the supercritical level of the processing chamber at a process pressure of about 221 atmospheres and at a process temperature of about 374° C.

20. The system of claim 18 wherein the fluid distribution device is an ultrasonic applicator.

21. The system of claim 18 wherein the fluid distribution device is a nebulizer.

22. The system of claim 18 wherein the heater is positioned proximate to the substrate for heating the substrate to the supercritical temperature.

23. The system of claim 18 wherein a temperature throughout the processing chamber is not uniform.

24. A system for fabricating an insulating layer on a substrate, comprising:

a processing chamber for housing a semiconductor substrate;

a control device for controlling the chamber at a supercritical level;

a fluid distribution device for providing a non-supercritical fluid to the chamber; and

a device for converting the fluid to a supercritical state using enhanced pressure and/or temperature proximate the substrate, and wherein the insulator layer is formed by contact between the substrate and the supercritical fluid.

25. The system of claim 24 wherein the fluid distribution device is an ultrasonic applicator.

26. The system of claim 24 wherein the fluid distribution device is a nebulizer.

27. The system of claim 24 wherein the semiconductor substrate comprises a diamond, the substrate including a n-type region and a p-type region.

28. The system of claim 27 wherein the p-type region comprises a boron doped region.

29. The system of claim 27 wherein the n-type region comprises a deuterium-boron complex region, the n-type layer formed by a plasma treatment of the boron doped region.

30. The system of claim 24 wherein the fluid distribution device is operable to cycle between providing fluid to the process chamber and providing no fluid to the process chamber until the insulating layer reaches a desired thickness, wherein the cycle is defined by a timer associated with the fluid distribution device.

31. The system of claim 24 wherein the converting device is positioned proximate to the substrate for heating the substrate to the supercritical temperature.

32. The system of claim 31 wherein a temperature throughout the chamber is non-uniform.